

Claims:

I claim:

1. A communication filter comprising:  
a dielectric block having a first and a second end portion and a  
5 central portion therebetween;  
a first and a second antenna coupling pad on the block;  
a transmitter coupling pad on the block;  
a receiver coupling pad on the block;  
a plurality of coupled resonators extending through the block;  
10 a trap resonator extending through the block and located in the  
central portion between the first and the second antenna coupling pads,  
the trap resonator providing attenuation outside of a desired  
passband.
2. The communication filter according to claim 1 further  
15 comprising a second trap resonator extending through the block and  
located at an end portion.
3. An antenna duplexer comprising:  
a dielectric block having three sets of paired opposed sides and a  
central portion;  
20 a first and a second antenna coupling electrode on the elongate  
ceramic block in the central portion;  
a first section extending between the first antenna electrode and a  
first end of the block;  
a second section extending between the second antenna electrode  
25 and a second end of the block, the second end opposing the first end,  
each section having a plurality of coupled resonators extending  
between one set of the paired opposed sides;  
a trap resonator in the central portion; and  
a relatively expansive metallized area located on the block for  
30 providing a reference potential.
4. A communication signal filter comprising:  
a core of dielectric material having a first end, a second end, a top

surface, a bottom surface and defining a plurality of through-holes each extending between an opening on the top surface and an opening on the bottom surface;

- 5           a plurality of metallized areas on the core including,  
          a first input-output coupling area,  
          a second input-output coupling area spaced apart from the first input-output coupling area along a length of the core between the first and second ends,  
          a third input-output coupling area positioned between the  
10       first input-output coupling area and the first end,  
          a fourth input-output coupling area positioned between the second input-output coupling area and the second end,  
wherein the core and the plurality of metallized areas together define at least one through-hole resonator positioned between the first input-output  
15       coupling area and the second input-output coupling area.

5.       A communication signal filter comprising:  
          a core of dielectric material having a first end, a second end, a top surface, a bottom surface and defining a plurality of through-holes each extending between an opening on the top surface and an opening on the  
20       bottom surface;  
          a plurality of metallized areas on the core including,  
          a receiver coupling area,  
          a transmitter coupling area spaced apart from the receiver coupling area along a length of the core between the first and  
25       second ends,  
          a first antenna coupling area positioned between the receiver coupling area and the transmitter coupling area,  
          a second antenna coupling area positioned between the receiver coupling area and the transmitter coupling area,  
30       a relatively expansive area,  
wherein at least one of the plurality of through-holes is positioned

between the first and second antenna coupling areas to define a trap resonator.

6. The filter of claim 5 further comprising a decoupler between the first and second antenna coupling areas.

5 7. The filter of claim 6 further wherein the decoupler is one of the plurality of through-holes, said one having a metallized sidewall conductively connected to the expansive area at both the top surface and the bottom surface.

8. The filter of claim 5 wherein at least one of the plurality of  
10 through-holes is positioned between the first end of the block and the transmitter coupling area to define a trap resonator.

9. The filter of claim 5 wherein at least one of the plurality of through-holes is positioned between the second end of the block and the receiver coupling area to define a trap resonator.

15 10. The filter of claim 5 having four trap resonators.

11. A communication signal filter comprising:  
a dielectric core having a series of through-holes and bearing a pattern of metallized and unmetallized areas, the dielectric core having first and second opposing outer portions and a central portion  
20 therebetween;

the dielectric core and the pattern together defining at least two signal paths each including an input coupling, an output coupling and a series of through-hole resonators therebetween,

the dielectric core and pattern together further defining a through-  
25 hole resonator in the central portion and outside the two signal paths.

12. In a communication filter including a plurality of coaxial resonators formed in a monoblock having through-holes and a metallization pattern, the monoblock having first and second ends and a central portion therebetween, the improvement which comprises:

30 a first and a second input-output coupling area in the central portion; and

a trap resonator between the first and the second coupling areas.

13. In a communication filter including a plurality of coaxial resonators formed in a monoblock having through-holes and a metallization pattern, the monoblock having first and second ends and a central portion, the improvement which comprises:

5 a first and a second antenna coupling metallized area in the central portion;

a decoupler between the first and the second antenna coupling areas;

10 and a trap resonator between one of the first and the second antenna coupling areas in the central portion and the decoupler.